

APM 645 Nonparametric Statistics and Categorical Data Analysis

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Lecture : T.TH. 12:30-1:50 pm, Walters Hall Room 210
Office Hours : T. TH. 2:00-4:00 pm or by appointment
Textbook : (1). Lee, C.T. 1998. Applied Categorical Data Analysis. John Wiley and Sons. 287p.
(2). Sprent, P. and N.C. Smeeton. 2001. Applied Nonparametric Statistical Methods. 3rd Ed. Chapman & Hall/CRC. 461p.
(3). SAS 9.1 Online Docs (both HTML and PDF) at <http://support.sas.com/documentation/onlinedoc/91pdf/index.html>.

Course Objectives:

APM 645 combines statistical techniques in Nonparametric Statistics and Categorical Data Analysis. The course is designed for students in policy, management, social sciences, and any students who need to conduct statistical analysis on categorical data or numerical data with irregular distributions or small sample sizes. The course focuses on statistical concepts, nonparametric methods, and computing for categorical data. SAS and SPSS will be used throughout the course. Example programs will be given for each procedure discussed in the course and the resultant computer output will be interpreted in detail.

Course Outline:

1. Introduction and Review of Basic Statistics
2. Tests for One Sample, Two-Related Samples, and Two Independent Samples (t-test, sign-test, median test, and Mann-Whitney-Wilcoxon test)
3. Concept of ANOVA and Nonparametric ANOVA (Kruskal-Wallis and Brown-Mood tests)
4. Tests for Proportions (Binomial test, McNemar's test, Cochran-Mantel-Haenszel test)
5. χ^2 -test and Contingency Tables (with Correspondence Analysis)
6. Kolmogorov-Smirnov Goodness-Of-Fit Test
7. Correlation / Association Analysis (Pearson's r, Spearman's Rho, Kendall's Tau, Somers' D, and Kappa Coefficient)
8. Nonparametric Regression (Logit/ Logistic, Probit, Poisson, LOESS, and Robust regression)
9. Bootstrapping, jackknifing, and cross-validation

Reference:

Conover, W.J. 1980. Practical Nonparametric Statistics. 2nd Ed. John Wiley and Sons.
Agresti, A. 1990. Categorical Data Analysis. John Wiley and Sons.
Long, J.S. 1997. Regression Models for Categorical and Limited Dependent Variables. Sage.
Hollander, M. and D.A. Wolfe. 1999. Nonparametric Statistical Methods. 2nd Ed. John Wiley and Sons.

Evaluation:

Your progress will be evaluated by the following weights:

Homeworks/Assignments	100%
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Note:

- (1) No exams!
- (2) You will have homework assignments for each chapter. Homeworks will usually require statistical analysis and interpretation of the results. You may work with other students on statistical computing and discussion of potential solutions. You will be expected to submit your own report for the analysis results. Copying the report from each other is NOT acceptable.

Grading System:

Your final grade will be determined as follows:

95 - 99	=	A
90 - 94	=	A-
85 - 89	=	B+
80 - 84	=	B
75 - 79	=	B-
< 75	=	F

Good Luck!